

**Claims:**

- 1           1.       A process for coating, at least in part, a carbon black with an adhering layer of  
2 aluminum oxide and/or hydroxide, comprising:  
3               a)       impregnating the carbon black with a colloidal suspension formed by  
4 hydrolysis of a solution of aluminum alkoxide in an alcoholic solvent.  
5               b)       removing the alcoholic solvent by evaporation; and  
6               c)       heat-treating the black thus impregnated so as to transform the aluminous  
7 layer present at its surface into an adhering layer of aluminum oxide and/or hydroxide.
2.       The process of Claim 1, wherein the aluminum alkoxide is an alkoxide  
              comprising 1 to 6 carbon atoms.
3.       The process of Claim 2, wherein the aluminum alkoxide is selected from the  
              group consisting of aluminum methoxide, aluminum ethoxide, aluminum (iso)propoxide  
              aluminum butoxides, and mixtures thereof.
- 1           4.       The process of Claim 1, wherein the alcoholic solvent is selected from the group  
2 consisting of methanol, ethanol, (iso)propanol, the various isomers of butanol, and mixtures  
3 thereof.

1            5.        The process of Claim 1, wherein the colloidal suspension comprises nitric acid as  
2        a hydrolysis catalyst for the aluminum alkoxide solution.

1            6.        The process of Claim 1, wherein the heat treating is carried out at a temperature of  
2        between 100 and 900°C.

1            7.        A modified carbon black coated with an adhering layer of aluminum oxide and/or  
2        hydroxide, obtainable by the process according to any one of Claims 1 to 6.

3            8.        The modified carbon black of Claim 7, wherein the modified carbon black has an  
4        amount of surface aluminum greater than 0.25% (% by mass).

5            9.        The carbon black of Claim 8, wherein the amount of surface aluminum is between  
6        0.5% and 5% (% by mass).

1            10.       A modified carbon black, characterized by:

2            (i)       being coated at least in part by a layer of aluminum oxide and/or  
3        hydroxide;

4            (ii)       having a specific BET surface area of between 30 and 400 m<sup>2</sup>/g;

5            (iii)       having an average particle size (by mass),  $d_w$ , of between 20 and 400 nm;

6 and having an

7 (iv) ultrasound disagglomeration rate,  $\alpha$ , greater than  $1 \times 10^{-3} \mu\text{m}^{-1}/\text{s}$ , said rate  
8 being measured via an ultrasound disagglomeration test at 10% power of a 600 watt ultrasonic  
9 probe.

1 11. The carbon black of Claim 10, wherein the disagglomeration rate  $\alpha$  is greater than  
2  $1.5 \times 10^{-3} \mu\text{m}^{-1}/\text{s}$ .

12 The carbon black of Claims 10 or 11, wherein the black has an amount of surface  
aluminum greater than 0.5% (% by mass).

13 The carbon black of Claim 12, wherein the amount of surface aluminum is  
between 0.5% and 5%.

1 14. The carbon black of Claim 13, wherein the amount of surface aluminum is  
2 between 0.5% and 3%.

1 15. A process for producing a reinforcing carbon black for tires, the carbon black  
2 having the following characteristics:

3 (i) it is coated at least in part by a layer of aluminum oxide and/or hydroxide;

- (ii) its specific BET surface area is between 30 and 400 m<sup>2</sup>/g;
- (iii) its average particle size (by mass),  $d_w$ , is between 20 and 400 nm;
- (iv) its ultrasound disagglomeration rate,  $\alpha$ , is greater than  $1 \times 10^{-3} \mu\text{m}^{-1}/\text{s}$ ,

wherein said rate is measured via an ultrasound disagglomeration test of 10% power of a 600 watt ultrasonic probe;  
the process comprising

- a) impregnating a starting tire-grade carbon black with a colloidal suspension formed by hydrolysis of a solution of aluminum alkoxide in an alcoholic solvent;
- b) removing the alcoholic solvent by evaporation; and
- c) heat-treating the black thus impregnated so as to transform the aluminous layer present at its surface into an adhering layer of aluminum oxide and/or hydroxide.

16. The process of Claim 15, wherein the starting carbon black is a reinforcing carbon black selected from the series 100, 200 or 300 (ASTM grades).

17. The process of Claim 15, wherein the aluminum alkoxide is an alkoxide comprising 1 to 6 carbon atoms.

18. The process of Claim 17, wherein the aluminum alkoxide is selected from the

1 group consisting of aluminum methoxide, aluminum ethoxide, aluminum (iso)propoxide,  
2 aluminum butoxides and mixtures thereof.

1 19. The process of Claim 15, wherein the alcoholic solvent is selected from the group  
2 consisting of methanol, ethanol, (iso)propanol, the various isomers of butanol, and mixtures  
3 thereof.

1 20. The process of Claim 15, wherein the colloidal suspension comprises nitric acid.

1 21. The process of Claim 15, wherein the heat treating is carried out at a temperature  
2 of between 100 and 900°C.

1 22. A process for reinforcing a diene rubber composition which can be used for the  
2 manufacture of tires, comprising incorporating a carbon black according to any one of Claim 10  
3 into the composition by mixing in an internal mixer, before introducing a vulcanization system.

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